

Training the Next Generation of RISA

Connecting Environmental Science and Decision Making (CESD) – a Graduate Certificate Program

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What is a Graduate Certificate Program at the UA?

A “linked series of credit-bearing graduate courses that constitute a coherent body of study. Graduate certificates are designed to enhance the education of matriculated graduate and professional students or to provide continuing education to local professionals.”

Some of the general guidelines:

- Enhances existing programs, not take the place of them.
- A specialized set of courses, minimum of 9 credits.
- Time to complete: within 4 years.
- **Sufficient resources must exist to support the certificate without penalizing existing academic programs.**

CESD ADVISORY BOARD

CESD program development: a collaborative process

Contributions from UA Colleges of Science, Humanities, Social and Behavioral Sciences, Agriculture and Life Sciences, Law, Public Health; Departments/Schools of Ag and Education, Anthropology, Geography, Journalism, Communication, Soil, Water & Environment, Public Administration, American Indian Studies, Planning, Natural Resource & Environment, Statistics, Watershed Managementand more....



Michael
Crimmins



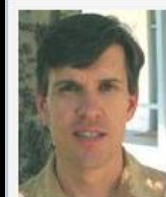
Daniel
Ferguson



Gregg Garfin



Diana Liverman



Christopher
Scott



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CESD Certificate Program

Overall goal: help students develop into professionals who are comfortable working with both scientific and decision-making communities in a variety of capacities.

Through course work and an internship, CESD students:

- Develop a foundation in the theoretical basis of the interface between science and decision making.
- Critically examine, evaluate, and practice methods of engagement between scientists and decision makers
- Acquire expertise in methods and skills needed for research that incorporates science-decision making interactions

CESD CURRICULUM

Core 1 Overview course:

GEOG 596M
Making the Connection between
Science and Decision Making

Core 2 Methods in social science:

AED 617
Research, Methods and Project
Design

ANTH 537
Data Management and Analysis

ANTH 609
Mixed Methods in Applied
Anthropology

CPH 544
Fundamentals of Evaluation

GEOG 696Q
Participatory Systems Design and
Delivery

JOUR 489/589
Survey of Research Methods

MGMT 600
Behavioral Science Theory and
Method in Management

PA 553
Quantitative Policy Analysis

Core 3 Communications:

AED 537
Methods of Facilitating Learning

AGMT 422/522
Communicating Knowledge in
Agriculture and the Life
Sciences

COMM 550
Communication and Cognition

COMM 620
Social Influence

JOUR 472/572
Science Journalism

JOUR 480/580
Multimedia Storytelling: Science
and Technology

JOUR 496D/596D
International Opinion Writing

SWES 415/515
Translating Environmental
Science

WFSC 595A
Biopolitics: Communication and
Public Relations Skills

4th course electives:

AED 621
Program Planning and Evaluation

AIS 531A
Tradition Ecological Knowledge

AREC 575*
Econ Eval Wtr+Env Policy

DVP 621
Nat Resource Mgmt:Applications

GEOG 424/524
Integrated Geographic Information
Systems (IGIS)

GEOG 516E
Geovisualization

GEOG 517
Geog Inf Sys/Nat+Soc Sci

GEOG 596J
Water Management & Policy

GEOG 596K
Risk and Society

GEOG 696O
Resilience and Adaptation

LAW 603J
Sustainability and Environmental Policy

LAW 643D
Native Am Nat Resources

MGMT 696D
Judgment and Decision Making

PA 581
Environmental Policy

PA 581A

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12 credits with a 3-credit internship

CESD Internship

Goal: to create an opportunity for the student to interact with a decision maker in order to gain experience and insight on the challenges of working at the interface between science and decision making.

Criteria:

- Requires close interaction with a decision maker or decision making organization
- Entails interactive, iterative engagement
- Results in an end product/contribution as the result of a collaborative effort

Internships to date:

- City of Tucson Office of Sustainability
- City of Tucson Office of the Mayor
- Weyerhaeuser
- Salt River Project

Graduate seminar: Making the Connection between Science and Decision Making

Goal: to provide students with some understanding of the **dynamics** behind the **interface between science and decision** making that result in **scientific information being incorporated into planning, policy, and management decisions**

3 Components:

- foundational concepts related to the use of science in decision making
- interactions between scientists and decision makers, and models for these interactions
- written and orals skills for translational science

CESD Students

Certificate:

- First students enrolled in spring 2013
- To date: 3 have finished, 3 in progress, 2 incomplete
- A large number of inquiries but funding for non grads a problem

Seminar:

Numbers

- 48 students have taken the seminar over 4 years
- 12 enrolled for 2015

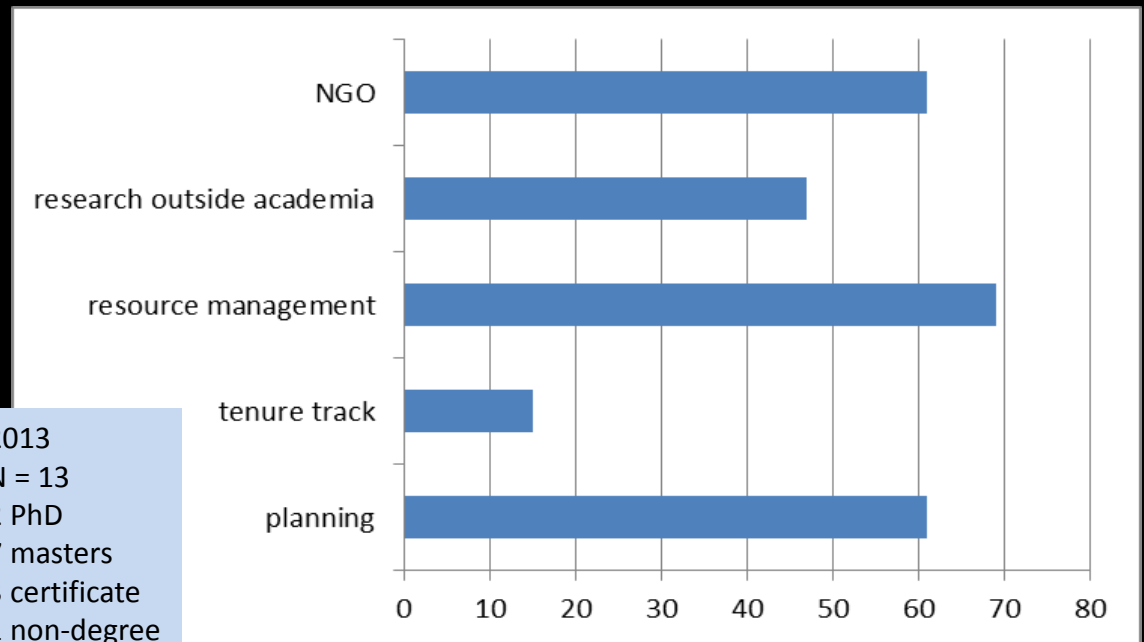
Background

- Social/physical/undecided background variable from over ½ physical to 1/3 in each category
- Typically most are grad students, with several non-degree or certificate-seeking students in most classes

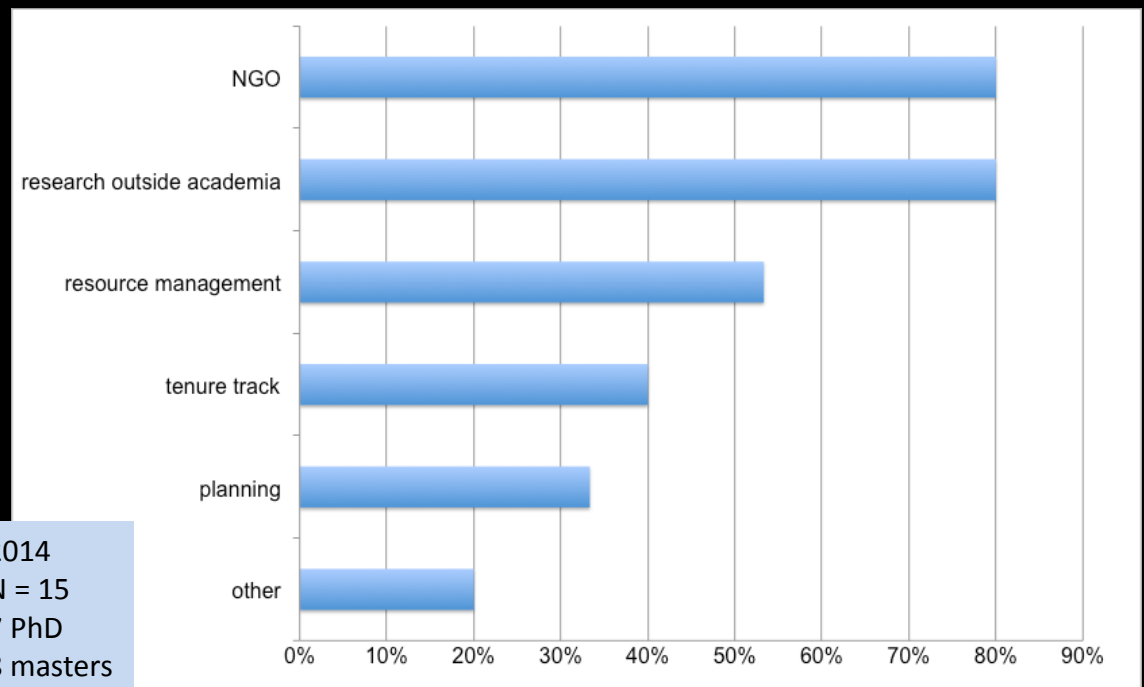
A few outcomes, based on
seminar exit surveys

Long-term career objectives (select all that apply)

2013
N = 13
2 PhD
7 masters
3 certificate
1 non-degree



2014
N = 15
7 PhD
8 masters

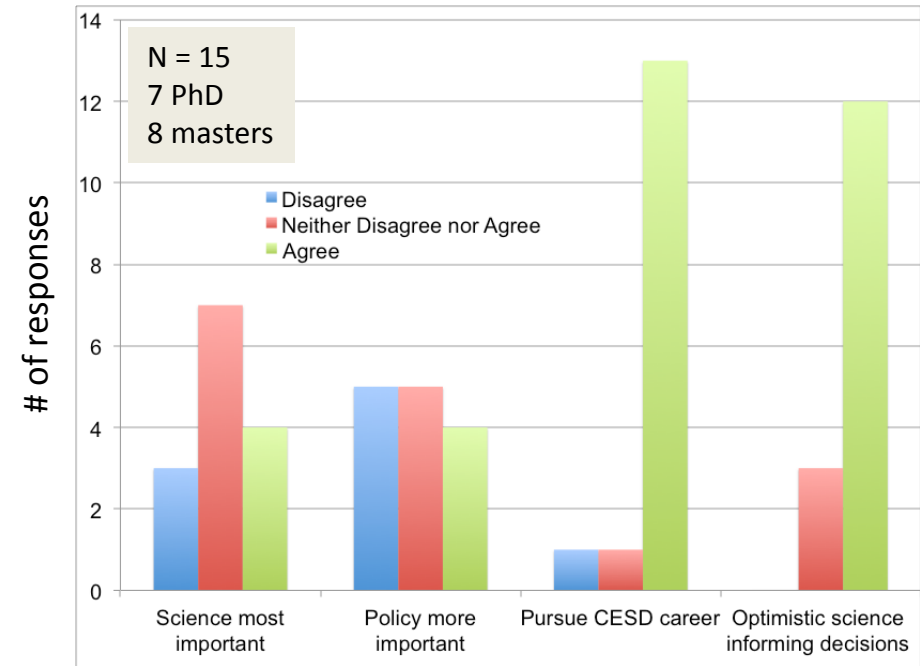
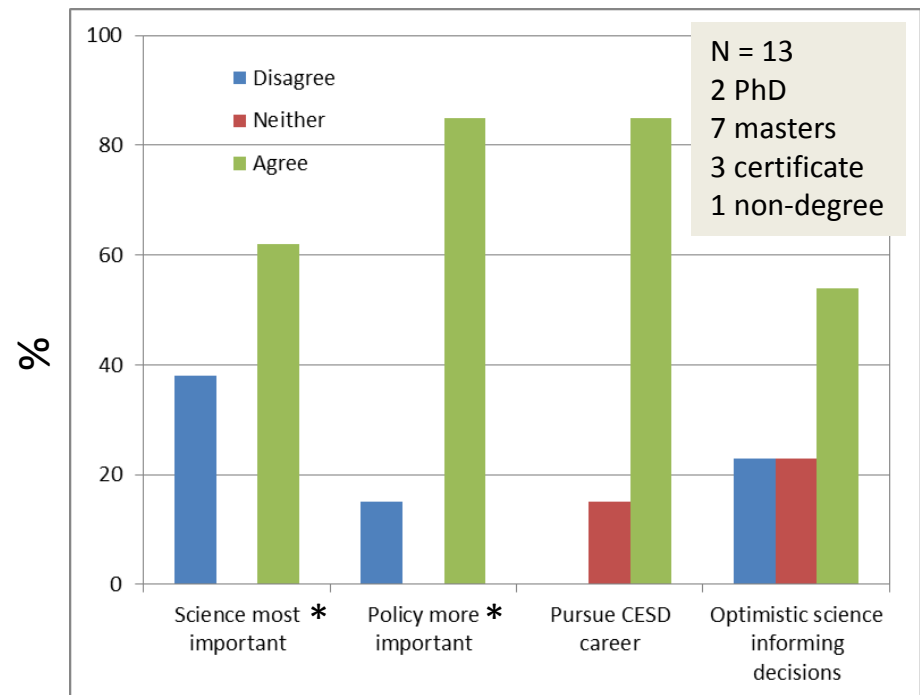


Perspectives on the importance of science and policy in decision making

* Science most important source of information

* Politics is ultimately more important than science in solving these problems

“Neither” was not a response option in this year



Some of the most important things students said they learned from the seminar

“I now appreciate the effort and time it takes to listen to stakeholder needs”

“More information does not equal better decisions.”

“The social science theory behind how science and policy do interact, can interact, and should interact.”

“Being exposed to the body of work (social science literature) and some case studies.”

“I was introduced to the realm of social science literature (while difficult and unusual it was useful) and the process of stakeholder engagement.”